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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/380,864	12/02/1999	MARTYN VINCENT TWIGG	JMYT-V00200	3166
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RATNERPRESTIA P O BOX 980 VALLEY FORGE, PA 19482-0980			LEUNG, JENNIFER A	
			ART UNIT	PAPER NUMBER
			1764	

DATE MAILED: 01/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/380,864

Applicant(s)

TWIGG, MARTYN VINCENT

Examiner

Jennifer A. Leung

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 October 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-12, 14-16, 18, 21-30, 32 and 34-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-12, 14-16, 18, 21-30, 32 and 34-37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Applicant's amendment submitted on October 17, 2005 has been received and carefully considered. Claims 1-8, 13, 17, 19, 20, 31 and 33 are cancelled. Claims 36 and 37 are new. Claims 9-12, 14-16, 18, 21-30, 32 and 34-37 remain active.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 9-12, 14-16, 18, 21-30, 32, 34-37 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding claims 9, 21, 34, 36 and 37, it is unclear as to where the limitation, "wherein the volume of the lean NO_x catalyst system is 300% or greater than that of the volume of the oxidation catalyst system," (claim 9, lines 14-15; claim 21, lines 12-13; claim 34, lines 15-16; claim 36, lines 11-13; claim 37, lines 11-12), finds support in Applicant's specification. It is noted that the specification only shows support for a lean-NO_x catalyst having a *length* that is three times, or 300%, the *length* of the oxidation catalyst (Example 1, page 6, line 16 to page 7, line 26; see Note (5), wherein the lean-NO_x catalyst is 9 in. long and the oxidation catalyst is 3 in. long). There is no indication that the respective diameters of the lean-NO_x catalyst and the

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oxidation catalyst are equal, and therefore, a *volume* ratio of 300% cannot be assumed.

Applicant further attempts to show that “increasing *catalyst length* and hence decreasing space velocity is beneficial in overall NO_x conversion.” (Test 2, page 5, line 14 to page 6, line 15).

Again, no catalyst diameters are specified. It is further noted that Test 2 not only varies the length of each catalyst *but also* varies the loading per unit volume of each catalyst. In particular, “The increase in NO_x conversion, at a constant platinum loading (1.5g) *per catalyst brick*, by decreasing space velocity *and reducing loading in g/unit volume* was measured.” (page 5, lines 16-18). As mentioned in Test 1 (page 5, line 12), a reduced loading per unit volume of catalyst improves NO_x selectivity. Thus, Test 2 does not sufficiently evidence that the increase in NO_x conversion was due solely to increasing catalyst length, since the catalyst loading per unit volume was varied simultaneously, and it was set forth in Test 1 that varying the catalyst loading per unit volume affects NO_x conversion.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 9-12, 14-16, 21-30 and 34-37 are rejected under 35 U.S.C. 103(a) as obvious over Tsuchitani et al. (EP 0 666 099) in view of Yokota et al. (JP 08-114116).

Regarding claims 9, 14, 21, 26, 34 and 35, Tsuchitani et al. discloses a combination of a lean burn engine (i.e., a gasoline or diesel engine, a boiler, etc. that generates exhaust gas under an oxidizing or air-rich atmosphere; page 3, lines 1-33; page 4, lines 1, 2 and 27-35; page 5, lines 23-26) and an emission control system, said emission control system comprising:

- a) a lean NO_x catalyst system comprising a platinum group metal (PGM) for

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- reducing NO_x to N_2 , wherein the PGM consists of platinum (page 7, lines 47-55);
- b) an oxidation catalyst system comprising a PGM, such as platinum, for oxidizing hydrocarbons and carbon monoxide, disposed downstream from the lean NO_x catalyst system (page 9, lines 38-44); and
- c) means for injecting hydrocarbon fuel into the exhaust upstream of the lean NO_x catalyst system (page 5, lines 27-49; see also FIG. 1, wherein the hydrocarbon fuel " C_3H_6 " is injected upstream of the lean NO_x catalyst 4);

wherein the platinum metal is present in the lean NO_x catalyst system at a loading of less than 30 g/ft^3 (i.e., generally, 0.1 to 30 grams Pt per liter of catalyst, or preferably, 0.5 to 5 grams Pt per liter of catalyst; page 7, line 56 to page 8, line 9).

Additionally, Tsuchitani et al. (page 4, line 6 to page 5, line 14; see claims) discloses a process for controlling the emissions from said lean burn engine, above, said process comprising:

- a) passing exhaust gases from the engine over said lean NO_x catalyst system;
- b) passing the product gases exiting from the lean NO_x catalyst system over said oxidation catalyst system; and
- c) introducing additional hydrocarbon fuel into the exhaust gas upstream of said lean NO_x catalyst system.

Tsuchitani et al. (page 7, lines 37-46) suggests that the reactivity as manifested by a given catalyst directly relates the space velocity of the exhaust gas relative to the catalyst bed, and hence, the reactivity as manifested by the catalyst is also a function of the catalyst volume. In particular, Tsuchitani et al. discloses,

"... the space velocity (S.V.) of the exhaust gas under treatment relative to the catalyst bed is preferable to be in the range of 1,000 to 300,000/hr, preferably 10,000 to

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200,000/hr. If the space velocity exceeds 300,000/hr, the catalyst will manifest ample reactivity with difficulty. Conversely, if it falls short of 1,000/hr, the catalyst will have to be increased in volume, and moreover, the diffusion in the flow path of gas will bring about the influence of nullifying the effect of intermittently introducing the reducing substance or imparting a reducing atmosphere to the exhaust gas.”

Tsuchitani et al., however, is silent as to the volume of the lean NO_x catalyst system being, specifically, 300 % or greater than that of the volume of the oxidation catalyst system.

Yokota et al. (FIG. 1; Abstract; Machine Translation) teaches an emission control system comprising a lean NO_x catalyst system (i.e., low-oxidation active zone **11**; sections [0016]-[0018]) located upstream of an oxidation catalyst system (i.e., high-oxidation active zone **12**; sections [0019]). In particular, Yokota et al. teaches that the volume of the lean NO_x catalyst system **11** is much larger than the volume of the oxidation catalyst system **12**, wherein the volume of the lean NO_x catalyst system **11** may be 20 times, or 10 times, the volume of the oxidation catalyst system **12** (see section [0021], [0022]). As an example, Yokota et al. also teaches the lean NO_x catalyst **11** may have a length of about 10 cm to 30 cm, or 5 cm to 50 cm, as compared to the oxidation catalyst **12** having a length of about 0.5 cm to 10 cm, for a standard sized car (see section [0024]).

It would have been obvious for one of ordinary skill in the art at the time the invention was made to select an appropriate volume for the lean NO_x catalyst system relative to the oxidation catalyst system (i.e., such as the claimed ratio of at least 3:1, lean NO_x catalyst-to-oxidation catalyst) in the process and apparatus of Tsuchitani et al., on the basis of suitability for the intended use and absent showing any unexpected results thereof, because configuring the lean NO_x catalyst system to be significantly larger than the oxidation catalyst system improves the purification performance of the emission control system, as taught by Yokota et al.

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Additionally, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering optimum or workable ranges involves routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claims 10, 11, 22 and 23, Tsuchitani et al. is silent as to whether the NO_x catalyst has an activity sufficient to provide a ratio of % NO_x to % HC conversion of at least 0.2, or whether the oxidation catalyst has an activity sufficient to provide a % HC conversion greater than 80% and a % CO conversion greater than 70%, as measured under the testing conditions of 230 °C, a space velocity of 25,000 hr⁻¹ and a HC:NO_x input ratio of 3:1 counting the HC as equivalent propane. In any event, the modified system and method of Tsuchitani et al. meet the claims, since although the instantly claimed conversion rates for the given testing conditions are not specifically disclosed, a newly discovered property does not necessarily mean the product is unobvious, since this property may be inherent in the prior art. *In re Best* 195 USPQ 430 (CCPA 1977); *In re Swinehart* 169 USPQ 226 (CCPA 1971). The modified system and process of Tsuchitani et al. substantially comprises each of the elements of the instantly claimed invention and therefore one of ordinary skill in the art would not expect a different and/or unexpected result to be obtained. Furthermore, it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to select an appropriate temperature, space velocity and input ratio for the catalyst system evaluation on the basis of suitability for the intended use, since what is recited is merely a testing condition, and where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art, *In re Aller*, 105 USPQ 233.

Regarding claims 12 and 24, Tsuchitani et al. discloses the lean NO_x catalyst system may

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further comprise an alkaline earth metal (i.e., beryllium, magnesium, calcium, strontium barium, or a compound of the metal; page 7, lines 47-55).

Regarding claims 15 and 27, Tsuchitani et al. discloses the oxidation catalyst system PGM loading is about 100 g/ft³ (i.e., "... the noble metal to be preferable is desired to be in the range of 0.1 to 5 g per liter of the catalyst," page 9, line 55 to page 10, line 19).

Regarding claims 16 and 28, Tsuchitani et al. discloses the oxidation or lean NO_x catalyst system further comprise alumina, ceria or zirconia (page 8, line 33 to page 9, line 1).

Regarding claim 25, Tsuchitani et al. discloses the oxidation catalyst system further comprises a base metal (i.e., iron, nickel; page 9, line 55 to page 10, line 19).

Regarding claim 29 and 30, Tsuchitani et al. (page 7, lines 37-46) discloses,

"... the space velocity (S.V.) of the exhaust gas under treatment relative to the catalyst bed is preferable to be in the range of 1,000 to 300,000/hr, preferably 10,000 to 200,000/hr. If the space velocity exceeds 300,000/hr, the catalyst will manifest ample reactivity with difficulty. Conversely, if it falls short of 1,000/hr, the catalyst will have to be increased in volume, and moreover, the diffusion in the flow path of gas will bring about the influence of nullifying the effect of intermittently introducing the reducing substance or imparting a reducing atmosphere to the exhaust gas."

Accordingly, it would have been obvious for one of ordinary skill in the art at the time the invention was made to select the claimed space velocities in the method of Tsuchitani et al., because the specific space velocities would have been considered a result effective variable, and one having ordinary skill in the art would have routinely optimized the space velocity for each of the lean NO_x catalyst system and oxidation catalyst system on the basis of the desired catalytic reactivity. *In re Boesch*, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980). Furthermore, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

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Regarding claims 36 and 37, the same comments with respect to both Tsuchitani and Yokota et al. apply (see above). In addition, Tsuchitani discloses that the platinum catalyst is coated on a surface area-enlarging washcoat (i.e., a washcoat of inorganic oxide; see page 8, lines 33-40, and page 9, lines 16-37). In particular,

“As the refractory inorganic oxide, any of the inorganic oxides which are generally used as carriers for catalysts can be adopted. As typical examples of these inorganic oxides, α -alumina, γ -, δ -, η -, or θ -activated alumina, titania, zirconia, ceria, lanthana, or silica, mixtures thereof, and complex oxides may be cited.... The Brunauer-Emmett-Teller (hereinafter referred to as “BET”) surface area of the oxide is in the range of 10 to 400 m²/g, preferably 50 to 300 m²/g.”

4. Claims 18 and 32 are rejected under 35 U.S.C. 103(a) as obvious over Tsuchitani et al. (EP 0 666 099) in view of Yokota et al. (JP 08-114116), as applied to claims 9 and 21 above, and further in view of Kihara et al. (JP 05-288044).

Tsuchitani et al. is silent as to providing the lean NO_x catalyst system as two catalytic substrates arranged in parallel. Kihara et al. (FIG. 1; Abstract; Machine Translation) teaches an emission control system comprising a lean NO_x catalyst coated on two substrates 6 and 8 arranged in parallel. It would have been obvious for one of ordinary skill in the art at the time the invention was made to configure the lean NO_x catalyst on two substrates arranged in parallel in the modified system and process of Tsuchitani et al. because the space velocity through the catalysts can be made small even in the case of a high load, thereby improving the rate of NO_x purification, as taught by Kihara et al. (see also section [0018]).

Response to Arguments

5. Applicant's arguments filed October 17, 2005 have been fully considered but they are not persuasive. Regarding Applicant's argument (page 8, last paragraph) against the new matter rejection, Applicant asserts that,

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“... one of ordinary skill in the art would understand from Example I that the variables being investigated in the catalyst system of Table 3 are: (i) the catalyst components in each system; and (ii) the total length of the catalyst bricks in the system. In other words, all other variables are maintained constant (including the diameter of the catalyst brick). The applicant points out that the length of catalyst brick of the lean-NO_x catalyst (3) is 12 inches, the same as the total length of the catalyst brick in the lean NO_x catalyst + oxidation catalyst (5). The diameter of the catalyst bricks in both systems would have to be same or a direct comparison could not be made; it would not be possible to draw a direct comparison between the catalyst systems and the conclusion at page 7, line 24-26.”

The Examiner respectfully disagrees. It is unclear as to how one could assume from the data provided in Table 3 that the diameters of the bricks in the various catalyst systems are equal, with all other variables, aside from the catalyst components, maintained constant. Although Applicant notes that systems (3) and (5) have the same total length of 12 inches, it is unclear as to how a diameter comparison can be made with systems (1) and (2), which each have a total length of only 6 inches. Are we to further assume that the volumes of systems (1), (2), (3) and (5) are equal (and hence, the diameters of systems (1) and (2) are larger than the diameters of systems (3) and (5))? The M.P.E.P. states that any newly added limitations to the specification or claims must be supported in the originally filed application through “express, implicit, or inherent” disclosure. The Examiner maintains her assertion that the limitation of, “the lean NO_x catalyst system is 300% or greater than that of the volume of the oxidation catalyst system,” is not expressly, implicitly, or inherently supported in the disclosure.

Beginning on page 9 (Section A.), Applicant argues,

“... Tsuchitani warns that when space velocity decreases below a pre-determined flow rate, the catalyst volume must be increased. When the catalyst volume is increased, “the

diffusion in the flow path of the gas will bring about the influence of nullifying the effect of intermittently introducing the reducing substance or imparting a reducing atmosphere to the exhaust gas.” Tsuchitani, page 7, lines 43-46.

Thus, Tsuchitani teaches away from increasing the catalyst volume.”

The Examiner respectfully disagrees. Page 7, lines 43-46, of Tsuchitani states,

“For this invention, the space velocity (S.V.) of the exhaust gas under treatment relative to the catalyst bed is preferable to be in the range of 1,000 to 300,000/hr, preferably 10,000 to 200,000/hr. If the space velocity exceeds 300,000/hr, the catalyst will manifest ample reactivity with difficulty. Conversely, if it falls short of 1,000/hr, the catalyst will have to be increased in volume and, moreover, the diffusion in the flow path of gas will bring about the influence of nullifying the effect of intermittently introducing the reducing substance or imparting a reducing atmosphere to the exhaust gas.”

This passage suggests that the reactivity as manifested by a given catalyst directly relates to the space velocity of the exhaust gas relative to the catalyst bed, and hence, the reactivity as manifested by the catalyst is also a function of the catalyst volume. It is further *well known in the art* that for a given flow rate, as the volume of a catalyst substrate increases, the space velocity of the exhaust gas through the substrate subsequently decreases. The warning that Tsuchitani poses is that if the volume is *too large*, i.e., the case that the volume is so large that the space velocity falls short of 1,000/hr, a nullifying effect of the reducing substance occurs. There clearly exists a suitable volume between the range of being too large and being too small that brings about the optimum results.

Beginning on page 10 (Section B.), Applicant argues,

“...the “catalyst” in Tsuchitani is not a single component, but a collection of components which ultimately reduce NO_x to N₂ in exhaust gas.

... the “catalyst” of Tsuchitani does not disclose the claimed “lean NO_x catalyst platinum

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group metal (PGM) for reducing NO_x to N_2 .” As described above, the “catalyst” in Tsuchitani is a multi-component system that includes component (A)(a), a catalyst responsible for oxidizing NO_x to NO and N_2O and component (A)(b), which functions as an adsorbent, not a catalyst. The way in which N_2 is generated from the “catalyst” in Tsuchitani is by introducing the reducing substance onto the adsorbent component which releases NO_2 in the form of N_2 after exposure to a reducing material.”

It appears that Applicant is arguing that the “catalyst” of Tsuchitani does not meet the claims because the “catalyst” is a collection of components used to reduce NO_x to N_2 , instead of a single component of platinum. The Examiner respectfully disagrees. Claim 1, for example, recites,

“(a) a lean NO_x catalyst system comprising a lean NO_x catalyst platinum group metal (PGM) for reducing NO_x to N_2 wherein the lean NO_x catalyst PGM consists of platinum.”

Thus, the claim recites a lean NO_x catalyst system reducing NO_x to N_2 . The system comprises a platinum group metal, and the platinum group metal consists of platinum. The claim does not restrict the system to only platinum. Other catalytic components are within the scope of the claim, as long as any platinum group metal present as a component of the system is restricted to platinum only.

In addition, the “catalyst” components of Tsuchitani appear no different from the “catalyst” components as disclosed by Applicants. Page 2, lines 13-28, of the specification sets forth that Applicant’s “first catalyst system” may comprise platinum (Tsuchitani’s (A)(a)), alkaline earth metal compounds (Tsuchitani’s (A)(b)), and a surface area-enlarging washcoat comprising alumina (Tsuchitani’s (B)). Similarly, both Applicant and Tsuchitani disclose a reducing material injecting means (see Applicant’s specification, page 4, lines 4-10). Thus, the “catalyst” components of both Tsuchitani and Applicant are essentially identical, and the

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“catalyst” components of both Tsuchitani and Applicant will inherently function similarly under similar process conditions.

It further appears that Applicant is arguing that the platinum metal of his invention, *alone*, is responsible for causing the NO_x to become N₂ (where the reducing material does not play a role, and where the alkaline earth metal compounds do not play a role). The Examiner respectfully disagrees with Applicant’s assertion and contends that Applicant does not have a complete understanding of the mechanism of catalysis. As is generally known in catalysis, a catalytically active component merely *participates* in intermediate stages of the reaction by *increasing the rate of reaction*, i.e., by increasing the rate of reaction between the NO_x and the reducing material. Upon completion of reaction, the catalytically active component is liberated in a chemically unchanged form. Without the presence of a reducing material under the current conditions, wherein the reducing material is either originally contained within the exhaust gas or additionally injected, the reduction of NO_x to N₂ would not occur.

Beginning on page 11 (Section D.), Applicant argues,

“...The Examiner acknowledges that the “catalyst” of Tsuchitani is made up of several components that ultimately reduce NO_x to N₂... As a consequence, one skill in the art would not understand which component of the “catalyst” in Tsuchitani should be increased in volume in order to obtain an increase in purification performance as taught by Yokota.”

The Examiner respectfully disagrees. As identified in the rejection, one of ordinary skill in the art at the time the invention was made would understand that the component to be increased would be the volume of the substrate.

Beginning on page 12 (Section E.), Applicant argues,

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“The structural components of the emissions control system of Tsuchitani and Yokota are so different that one skilled in the art would not understand how to apply the teachings of Yokota to the emissions control system of Tsuchitani. For example, the “catalyst” of Tsuchitani does not disclose a low oxidation catalyst activity zone. Similarly, Yokota does not disclose components such as an oxidation component, adsorbent component, and a means for injecting a reducing material. Structurally, these two emission control systems are very different.”

The Examiner respectfully disagrees. Firstly, the “low oxidation catalyst activity zone” in Tsuchitani is the “lean NO_x catalyst system” as described in the rejection below. Secondly, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). In response to applicant's argument that Tsuchitani and Yokota constitute nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, both Tsuchitani and Yokota are concerned within improving the efficiency of NO_x reduction under lean exhaust conditions, wherein both references teach the use of a lean NO_x catalyst system located upstream of an oxidation catalyst system (see comments in rejection below).

On page 13 (Section F.), Applicant argues no likelihood of success in increasing the “catalyst” volume in Tsuchitani. As discussed above, it can be ascertained by Tsuchitani, page

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7, lines 43-46, that the reactivity as manifested by a given catalyst directly relates to the space velocity of the exhaust gas relative to the catalyst bed, and hence, the reactivity as manifested by the catalyst is also a function of the catalyst volume. It is further *well known in the art* that for a given flow rate, as the volume of a catalyst substrate increases, the space velocity of the exhaust gas through the substrate subsequently decreases. The warning that Tsuchitani poses is that if the volume is *too large*, i.e., the case that the volume is so large that the space velocity falls short of 1,000/hr, a nullifying effect of the reducing substance occurs. There clearly exists a suitable volume between the range of being too large and being too small that brings about the optimum results. Yokota et al. was thus provided to illustrate a suitable volume ratio between an upstream catalyst system of low oxidation activity (i.e., the lean NO_x catalyst) and a downstream catalyst system of high oxidation activity (i.e., the oxidation catalyst system) to obtain the optimum results.

Beginning on page 14 (Section G.), Applicant argues that the Examiner's conclusion of obviousness is based upon improper hindsight reasoning. However, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

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As set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


* * *

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A. Leung whose telephone number is (571) 272-1449. The examiner can normally be reached on 9:30 am - 5:30 pm Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jennifer A. Leung

January 21, 2006 


HIEN TRAN
PRIMARY EXAMINER